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(71)Applicant : SECOM CO LTD

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(72)Inventor : SHIBASHI JUNTARO
ISHIKITA KATSUTOSHI

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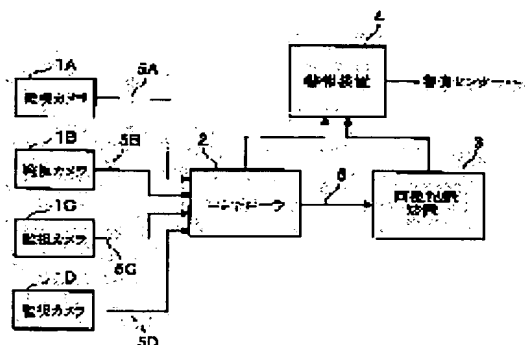
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(54) MONITORING CAMERA DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To effectively detect the change of an image pickup direction or view in an image pickup means such as a monitoring camera detecting that the direction of image picking-up in the image pickup means is changed based on the detection result of an image pickup means image picking-up direction change detection means and giving an alarm.

SOLUTION: When the direction of image picking-up in one of monitoring cameras 1A-1D is changed, a vertical direction angle detection gyro sensor and/or a horizontal direction angle detection gyro sensor which is installed in the monitoring camera 1A whose image picking-up direction is changed outputs a signal corresponding to the angular velocity of the rotation. When an angular velocity signal shows the change of the angular velocity of not less than a prescribed level, a processing circuit outputs the signal to a signal transmission part by considering that the illegal turning operation of the monitoring camera 1A is executed. When the control part of a controller 2 receives the signal, it transmits the result to an alarm output part as an abnormal signal and the alarm output part outputs an abnormal state to an alarm device 4 as an alarm signal. The alarm device 4 outputs an alarm to a security center through a telephone line.



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CLAIMS

[Claim(s)]

[Claim 1] The surveillance camera equipment provide an image pick-up means, an installation means attach said image pick-up means in a fixed part, an image pick-up means image pick-up sense change detection means of said image pick-up means detect migration of the direction of a single dimension as change of angular velocity or angular velocity at least, and an alarm-output means detect that the sense of an image pick-up of said image pick-up means changed based on the detection result of said image pick-up means image pick-up sense change detection means, and output an alarm.

[Claim 2] Said image pick-up means image pick-up sense change detection means is surveillance camera equipment containing two gyroscope sensors which detect the angular velocity of a mutually different direction, and a vertical angular velocity according to claim 1.

[Claim 3] Surveillance camera equipment according to claim 1 or 2 which established the return means which carries out an auto return toward the image pick-up sense of the basis of said image pick-up means when the force currently applied is opened wide after the force was applied to said image pick-up means between said installation means, said image pick-up means, or said installation means and said image pick-up means and the image pick-up sense of said image pick-up means changed.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention installs a surveillance camera in a building, a store, and other locations, and relates to the surveillance camera equipment which supervises and records action of a suspicious person on videotape. This invention relates a malfeasance which the image pick-up sense of a surveillance camera is changed [malfeasance] unjustly, and does not make a suspicious person picturize especially to beforehand detectable surveillance camera equipment.

[0002] The image data which installed the surveillance camera in the entrance of the inside of the store which is a monitoring station, or a store from the former, and was transmitted from this surveillance camera is displayed on the monitor in which it was prepared in the monitor center, or the surveillance camera equipment which records this image data on videotape and is made into an ex post proof is known. In such surveillance camera equipment, the image pick-up direction is adjusted so that a predetermined monitoring station may be picturized, for example, it attaches in head lining etc., and the surveillance camera is fixed using a device.

[0003] However, with the conventional surveillance camera equipment mentioned above, there is a possibility of performing a malfeasance where those who perform a malfeasance rotated the surveillance camera by hand etc. for example, it changed the image pick-up direction of a surveillance camera and a monitor field is removed from the visual field of a surveillance camera. since an image pick-up condition changes with the malfeasances which change the image pick-up direction of a surveillance camera, if the hitcher on who is present in a monitor center is monitoring the monitor continuously, such a malfeasance can be noticed, but since the hitcher on is not necessarily monitoring the monitor continuously, the case where a malfeasance which changes the image pick-up direction of a surveillance camera is not noticed comes out, and he comes out and comes. Although it can know having changed the image pick-up direction of a surveillance camera from an image transcription result later, it comes after the **** part after the malfeasance was performed then in many cases.

[0004] When switching the image data of many surveillance cameras one by one even when the hitcher on is always supervising the monitor in a monitor pin center, large, and displaying on the monitor, change of such an unjust image pick-up direction may be unable to be supervised.

[0005] As an approach of detecting modification of such inaccurate image pick-up range, this applicant As indicated to JP,10-185940,A, a light emitting/receiving unit is formed in a part with the surveillance camera currently supported by head lining through fixing metal. When reflective units, such as a mirror, are prepared in the location of this light emitting/receiving unit and head lining which counters and the sense of a surveillance camera is changed, It detected that the reflected light from the light emitting/receiving unit formed in the surveillance camera lost, and the surveillance camera equipment into which the sense of a surveillance camera was changed and which carries out thing detection is proposed.

[0006]

[Problem(s) to be Solved by the Invention] Since it is the need that a light emitting/receiving unit is located in a field parallel to the field of head lining, it is necessary to adjust and the approach indicated by JP,10-185940,A needs to arrange the sense of the reflective unit prepared in head lining, the sense of the light emitting/receiving unit attached in a surveillance camera, or both sense so that the field of a reflective unit and the ray axis of a light emitting/receiving unit may intersect perpendicularly, when the sense of an image pick-up of a surveillance camera has a certain include angle to head lining.

[0007] This invention means the improvement approach of the surveillance camera equipment indicated to JP,10-185940,A, or the alternate method of the surveillance camera equipment indicated to JP,10-185940,A, is devised, and aims at offering detectable surveillance camera equipment for the image pick-up direction or visual fields of an image pick-up means, such as a surveillance camera, having changed still more effectively.

[0008]

[Means for Solving the Problem] According to this invention, the surveillance camera equipment provide an image pick-up means, an installation means attach said image pick-up means in a fixed part, an image pick-up means image pick-up sense change detection means of said image pick-up means detect migration of the direction of a single dimension as change of angular velocity or angular velocity at least, and an alarm-output means detect that the sense of an image pick-up of said image pick-up means changed based on the detection result of said image pick-up means image pick-up sense change detection means, and output an alarm is offered. It is detectable that an action in which an image pick-up means image pick-up sense change detection means detects change of the sense of an image pick-up of an image pick-up means as change of angular velocity or angular velocity, and removes the image pick-up field of image pick-up means, such as a surveillance camera, from a monitor field was performed.

[0009] Preferably, said image pick-up means image pick-up sense change detection means contains two gyroscope sensors which detect the angular velocity of a mutually different direction, for example, a horizontal angular velocity, and a vertical angular velocity. As a sensor used for detection of change of angular velocity, change of angular velocity can be detected only by attaching in an image pick-up means etc., for example, it is not dependent on physical relationship with fixed parts, such as head lining, at all, and a small gyroscope sensor is suitable. By forming two gyroscope sensors which detect a still more nearly horizontal angular velocity and a vertical angular velocity, a three dimension angular-velocity change is detectable.

[0010] Still more preferably, after the force is applied to said image pick-up means between said installation means, said image pick-up means, or said installation means and said image pick-up means and the image pick-up sense of said image pick-up means changes, when the force currently applied is opened wide, the return means which carries out an auto return toward the image pick-up sense of the basis of said image pick-up means is established. If the sense of image pick-up means, such as a surveillance camera to the outside of the unjust visual field mentioned above, is changed slowly, change by the gyroscope sensor is minute and such an unjust action cannot be detected. However, after a malfeasance, if its hold is released, a return means will act and it will return to the original location automatically and quickly. Since migration of the image pick-up means by this return means can detect by the above-mentioned gyroscope sensor, it is detectable immediately after performing a malfeasance.

[0011]

[Embodiment of the Invention] The gestalt of operation of the surveillance camera equipment of this invention is described with reference to an accompanying drawing.

Gestalt drawing 1 of the 1st operation is the whole surveillance camera equipment block diagram of the gestalt of the 1st operation of this invention. Surveillance camera equipment has the image recording equipment 3 connected with the controller 2 connected with two or more surveillance cameras 1A-1D, the surveillance cameras 1A-1D of these plurality, and coaxial cables 5A-5D, and the controller 2 with the coaxial cable 6, and the alarm 4 connected to a controller 2 and image recording equipment 3. In the gestalt of this operation, although the case where four sets of surveillance cameras 1A-1D were prepared was illustrated, the number of a surveillance camera is 1 or plurality, and arbitration.

[0012] Two or more surveillance cameras 1A-1D are equipped with an image pick-up function and a voice detection function, they detect a sound signal, respectively while they picturize a predetermined monitor field, and they output the image pick-up and a voice detection result to a controller 2 through coaxial cables 5A-5D. A controller 2 carries out signal processing of the image pick-up and voice detection result which have been transmitted from surveillance cameras 1A-1D, and sends out the result to image recording equipment 3. About signal processing in a controller 2, it mentions later with reference to drawing 4. For example, a controller 2 makes sequential selection of the image pick-up result (image data) and voice detection result (voice detection data) which were sent out from surveillance cameras 1A-1D, changes the selected image pick-up from a surveillance camera and the selected voice detection result into a digital signal, and sends them out to image recording equipment 3. A controller 2 carries out compression processing of the image data and voice detection data which were changed into the digital signal if needed, and sends them out to image recording equipment 3. Image recording equipment 3 records the image data and voice detection data which were sent out from the controller 2. Abnormality signal processing is carried out, and an alarm 4 sends out an alarm signal to the defense center established in the remoteness which is not illustrated through the telephone line, when the thing with a malfeasance sent out from the controller 2 is detected. An alarm 4 can also send out an alarm signal to the defense center which is not illustrated, when it is detected from image recording equipment 3 again sending out and that carried out abnormality signal processing and the malfeasance occurred.

[0013] Drawing 2 is drawing illustrating the installation condition of typical surveillance camera 1A of the surveillance cameras 1A-1D. Fixing metal 101 turns [head lining] to a lower part, and is being fixed to it. The shaft 102 is established at the tip of lower of fixing metal 101. The justification holder 103 is connected to the shaft 102. These fixing metal 101, a shaft 102, and the justification holder 103 are named generically and attached, and it is called a device or the installation means 100.

[0014] Surveillance camera 1A has the image pick-up section one A1, the circuit section one A2, and cable 1 A3. The image pick-up section one A1 points to the image pick-up direction D. The monitor field in which ATM was installed ahead of the image pick-up direction D exists. In the gestalt of this operation, surveillance camera 1A picturizes the field in which ATM was installed as a monitor field. Cable 1 A3 also includes the feeder which supplies electric power to the power supply section of the circuit section one A2 including coaxial cable 5A illustrated to drawing 1. The internal configuration of surveillance camera 1A is described with reference to drawing 3.

[0015] Reference of drawing 2 connects the justification holder 103 to the end side of the upper part of the circuit section one A2 of surveillance camera 1A. The tip of the justification holder 103 is fixed to a shaft 102 so that the monitor field which surveillance camera 1A mentioned above can be picturized, and the optical axis of surveillance camera 1A may become an obtuse angle a little to a perpendicular direction. Whenever [fixed angle / of the justification holder 103 to a shaft 102] specifies the image pick-up direction of the vertical direction of surveillance camera 1A. Angle of rotation of the justification holder 103 is adjusted, and the horizontal sense of surveillance camera 1A can be adjusted. Thus, adjustment of whenever [setting-angle / of the justification holder 103 to a shaft 102] and adjustment of angle of rotation of the justification holder 103 can adjust the visual field of surveillance camera 1A in three dimension.

[0016] If a malfeasance person changes whenever [fixed angle / of the justification holder 103 to a shaft 102] or, on the other hand, changes angle of rotation of the justification holder 103, it will also become separating from the visual field of surveillance camera 1A from the monitor field mentioned above. In order to detect change of the sense of such surveillance camera 1A, in the gestalt of this operation, two gyroscope sensors, i.e., gyroscope sensor 13a for perpendicular direction angular-velocity detection a, and gyroscope sensor 13b for horizontal angular-velocity detection were prepared in the interior of the image pick-up section one A1.

[0017] A gyroscope sensor is an angular-velocity sensor which detects vibration of piezo-electric mold vibrator, such as for example, ceramic bimorph vibrator, as Coriolis force, and changes and outputs the detecting signal to an electrical signal. With 8mm long, 15mm wide, and an about [height 4mm] dimension, since the gyroscope sensor is small, it can be easily attached in the image pick-up section one A1 of surveillance camera 1A. Moreover, you do not need to make it located relatively and a gyroscope sensor has an advantage like the light emitting/receiving unit in the surveillance camera equipment indicated to JP,10-185940,A, and a reflective unit that what is necessary is just to attach in surveillance camera 1A. Since one gyroscope sensor detects the angular velocity of one direction fundamentally, when detecting angular velocity with a 2-way, for example, a horizontal direction, and a perpendicular direction to coincidence, two gyroscope sensors are needed. Although it is also good to prepare either gyroscope sensor 13a for perpendicular direction angular-velocity detection, or gyroscope sensor 13b for horizontal angular-velocity detection in order to detect the angular velocity of the minimum and an one direction for example, in the gestalt of this operation, the example which formed two gyroscope sensors 13a and 13b as suitable conditions is described. It is desirable to form a gyroscope sensor in the point of the image pick-up section one A1 which is the location most distant from the above-mentioned supporting point that is the part which the greatest angular moment generates to the node of the justification holder 103, and the shaft 102 and the justification holder 103 which are immobilization and the pivotable supporting point of surveillance camera 1A so that a bigger angular velocity can be detected. In the gestalt of this operation, gyroscope sensor 13a for perpendicular direction angular-velocity detection and gyroscope sensor 13b for horizontal angular-velocity detection are prepared near the point of the image pick-up section one A1. The gyroscope sensors 13a and 13b are formed in the interior of surveillance camera 1A, and it is preventing from checking by looking from the outside in the gestalt of this operation from a viewpoint which eliminates the malfeasance to the gyroscope sensors 13a and 13b.

[0018] Drawing 3 is one block diagram of surveillance cameras 1A-1D. Surveillance cameras 1A-1D are carrying out the same configuration. As a representative, when surveillance camera 1A is described, surveillance camera 1A has the image pick-up section 10, the sound-collecting section 11, the signal sending-out section 12, and the detection section 13. The image pick-up section 10 is located in the image pick-up section one A1 illustrated to drawing 2, and consists of a lens, a charge KAPPURUDO device (CCD), etc., and the image which let the lens pass changes it into an electrical signal in CCD, and it is outputted as image pick-up data (image data). The sound-collecting section 11 is formed in the image pick-up section one A1 illustrated to drawing 2, has a microphone, collects the sound in a monitor field, changes it into an electrical signal, and outputs it as a voice detecting signal. The sound-collecting section 11 can be formed in the location of the arbitration instead of the image pick-up section one A1. The signal sending-out section 12 is formed in the circuit section one A2 illustrated to drawing 2, inputs the voice detection data outputted from the image data and the sound-collecting section 11 which were outputted from the image pick-up section 10, changes these signals into a predetermined output signal, and sends them out to a controller 2 through coaxial cable 5A. The detection section 13 names generically and illustrates gyroscope sensor 13a for perpendicular direction angular-velocity detection attached in the image pick-up section one A1 illustrated to drawing 2, and processing circuit 13c which processes the angular-velocity signal with which these gyroscope sensor outputs gyroscope sensor 13b for horizontal angular-velocity detection. In this invention, the angular velocity itself or the signal which shows change of angular velocity can be used as a signal which detects change of the sense.

[0019] Drawing 4 is the block diagram of a controller 2. For example, a controller 2 and surveillance camera 1A are connected by coaxial cable 5A held in the interior of cable 1A3 illustrated to drawing 2, and the controller 2 is installed in the location from which the installation location of surveillance camera 1A was separated. The connection relation between a controller 2 and the other surveillance cameras 1B-1D is the same as that of the above. A controller 2 has the image-processing section 20, the image output section 21, a control unit 22, a control section 23, the interface section 24, a power supply section 26, the power off detecting element 27, and the alarm-output section 28. The authentication section 25 is formed near the controller 2 of the exterior of a controller 2. The image-processing section 20 quadrisections the image data in four surveillance cameras 1A-1D inputted via coaxial cables 5A-5D, and compresses it into the image data of one screen. Moreover, the image-processing section 20 chooses the sound signal of 1 from four sorts of sound signals with the control signal of a control section 23, and inputs it into the image output section. The image output section 21 outputs 4 image data compounded in the image-processing section 20, and the selected sound signal to timelapse video equipment 3 through a coaxial cable 6. A control unit 22 is a part into which it has a switch for a setup and operator guidance etc., and an operator performs various setup and operator guidance to a controller 2 through these switches. A control section 23 performs control processing of processing of the image-processing section 20, control processing of the alarm-output section 28, and control processing of the authentication section 25 connected through the interface section 24 based on the conditions which consisted of operation control units (CPU) of a computer etc., and were set up by the control unit 22, and the already specified conditions. The interface section 24 consists of RS232C and performs signal transfer between the authentication section 25 and a control section 23 (signal junction). A control section 23 cooperates with the authentication section 25 through the interface section 24, and performs authentication processing about rating of the operator who operates a controller 2 through a control unit 22 etc. Only the attested operator can perform setting-operation using a control unit 22. The authentication section 25 is a card reader. The interface section 24 has circuitry which suits it depending on the authentication section 25. A power supply section 26 generates the electrical potential difference which operates the electrical circuit in each electrical circuit in a controller 2, and/or the electronic circuitry in each electronic circuitry, and supplies a power source to each circuit inside a controller 2. What the power off detecting element 27 supervised the supply voltage of a power supply section 26, and the electrical potential difference of a power supply section 26 lost it for is detected. For example, when the electrical potential difference of a power supply section 26 loses as a power off detecting element 27 using the relay which operates on the electrical potential difference of a power supply section 26, the alarm 4 connected with the power off detecting element 27 because a relay contact closes can detect the power off of a power supply section 26. The alarm-output section 28

outputs an alarm signal to the alarm 4 illustrated to drawing 1 , when a malfeasance person does the cable one A1 illustrated to drawing 2 for cutting etc. and the image data from either of the surveillance cameras 1A-1D stops in the image-processing section 20.

[0020] Drawing 5 is the block diagram of image recording equipment 3. Image recording equipment 3 has the image transcription section 31, a control unit 32, a control section 33, the interface section 34, a power supply section 36, the power off detection section 37, and the alarm-output section 38. The authentication section 35 is formed in the exterior of image recording equipment 3. The image transcription section 31 records on videotape the image data of one screen compressed into the quadrisection which received from the controller 2 on a video tape. A control unit 32 operates initiation of an image transcription, a halt, timer actuation, attachment and detachment of a video tape, etc. The control section 33 consists of operation control units (CPU) of a computer etc., and performs motion control, such as the image transcription section 31 and the alarm-output section 38. The interface section 24 consists of RS232C and performs signal transfer between the authentication section 35 and a control section 33 (signal junction). A control section 33 cooperates with the authentication section 35 through the interface section 34, and performs authentication processing about rating of the operator who operates image recording equipment 3 through a control unit 32 etc. Only the attested operator can perform various kinds of setting-operation to image recording equipment 3 using a control unit 32. The authentication section 35 is a card reader. The interface section 34 has circuitry which suits it depending on the authentication section 35 and a control section 33. A power supply section 26 generates the electrical potential difference which operates the electrical circuit in each electrical circuit in image recording equipment 3, and/or the electronic circuitry in each electronic circuitry, and supplies a power source to each circuit inside image recording equipment 3. What the power off detection section 37 supervised the supply voltage of a power supply section 36, and the electrical potential difference of a power supply section 36 lost it for is detected. For example, when it loses in the electrical potential difference of a power supply section 36 as the power off detection section 37 using the relay which operates on the electrical potential difference of a power supply section 36, the alarm 4 connected with the power off detecting element 27 because a relay contact closes can detect the power off of a power supply section 36. The alarm-output section 38 outputs an alarm signal to the alarm 4 illustrated to drawing 1 , when the image data sent out from the controller 2 to the image transcription section 31 stops.

[0021] Actuation of the surveillance camera equipment of the gestalt of this operation is described. Especially processing when the sense of an image pick-up of one image pick-up of the surveillance cameras 1A-1D in the surveillance camera equipment of the gestalt of this operation changes is described. As initial actuation, the power source of each part of surveillance cameras 1A-1D is turned ON. Thereby, surveillance cameras 1A-1D picturize an image pick-up field in each image pick-up section 10, and the image pick-up result is changed into the picture signal of NTSC system in the signal sending-out section 12, and they are sent out to a controller 2 via coaxial cables 5A-5D. The image-processing section 20 in a controller 2 makes four image data picturized with surveillance cameras 1A-1D the image data of one screen. The image output section 21 outputs the image data to image recording equipment 3.

[0022] the surveillance camera into which the image pick-up sense was changed when the sense of one image pick-up of the surveillance cameras 1A-1D was changed here -- for example When the image pick-up sense of surveillance camera 1A is changed, are installed in surveillance camera 1A. Gyroscope sensor 13for perpendicular direction angular-velocity detection a and/or gyroscope sensor 13b for horizontal angular-velocity detection which were illustrated to drawing 2 output the signal according to the angular velocity of the rotation. Processing circuit 13c outputs a signal to the signal sending-out section 12 noting that sense actuation of inaccurate surveillance camera 1A is performed, when the angular-velocity signal shows change of the angular velocity more than predetermined level.

[0023] The signal sending-out section 12 changes the detection result from processing circuit 13c into a predetermined signal, and outputs it to a controller 2 through coaxial cable 5A with image data.

[0024] In the image-processing section 20 of a controller 2, the image data inputted via coaxial cable 5A and the signal which the above-mentioned gyroscope sensor detected are received, and the image-processing section 20 sends out the signal to a control section 23. A control section 23 is sent out to the alarm-output section 28 by making the result into an abnormality signal, when the above-mentioned signal is received. The alarm-output section 28 outputs an abnormal condition to an alarm 4 as an alarm signal. When the alarm signal is received, the alarm output of the alarm 4 is carried out to the defense pin center,large which is not illustrated through the telephone line. Consequently, it is notified that the image pick-up sense of surveillance camera 1A was unjustly changed into the guard in a defense pin center,large, and a quickly exact cure can be taken.

[0025] As mentioned above, although the example which prepared gyroscope sensor 13a for perpendicular direction angular-velocity detection and gyroscope sensor 13b for horizontal angular-velocity detection was described as a gestalt of suitable operation, change of the sense of the direction of a single dimension of surveillance camera 1A is detectable at least also only by preparing either gyroscope sensor 13for perpendicular direction angular-velocity detection a, or gyroscope sensor 13b for horizontal angular-velocity detection. Moreover, the signal sending-out section 12 may stop sending out of this pilot signal, when the pilot signal of predetermined frequency is always sent out to the controller 2 and a gyroscope sensor detects abnormalities. In this case, by the controller 2, if reception of a pilot signal becomes impossible, it will judge that a surveillance camera is unusual and an abnormality signal will be transmitted to an alarm 4.

[0026] With reference to gestalt drawing 6 of the 2nd operation, the surveillance camera equipment as a gestalt of the 2nd operation of this invention is described. Drawing 6 is drawing showing the installation condition of the surveillance camera as a gestalt of the 2nd operation of this invention corresponding to drawing 2 . Although the installation condition of the surveillance camera illustrated to drawing 6 is similar to the installation condition of the surveillance camera illustrated to drawing 2 , in drawing 6 , the return device 105 is established between fixing metal 101 and a shaft 102. That is, it attaches and means 100A is having structure which was illustrated to drawing 6 , which was illustrated to drawing 2 and to which it attached in and the return device 105 was added to the means 100. Other components are the same as

that of what was described with reference to drawing 2 .

[0027] Drawing 7 is drawing illustrating the structure of the return device 105 illustrated to drawing 6 . Drawing 7 (A) is the perspective view of the return device 105, drawing 7 (B) is the expansion side elevation of the return device 105, and drawing 7 (C) is the decomposition sectional view of the return device 105. Up body 105a, lower body 105b, and spring 105c are put together, and the return device 105 is constituted. The male screw projects in the upper and lower sides of up body 105a. The male screw of the upper part of up body 105a is thrust into the female screw of the lower part of fixing metal 101, and makes the lower part fix the return device 105 to fixing metal 101. The hole is prepared, the female screw with which the male screw of the lower part of up body 105a is screwed in is formed in the hole of the upper part of lower body 105b, and, as for the center of lower body 105b, the female screw with which the male screw (not shown) of a shaft 102 is screwed in is formed in the hole of the lower part of lower body 105b.

[0028] Where it fixed the end of spring 105c to the spring fixed hole of up body 105a and the outer case section of up body 105a and lower body 105b is held in the interior of spring 105c If the male screw of the lower part of up body 105a is thrust into the female screw of the upper part of lower body 105b and the other end of spring 105c is finally fixed to the screw fixation section of lower body 105b, the return device 105 illustrated to drawing 7 (A) will be composed. If the force of making left-hand side L rotating up body 105a, and for example making right-hand side R rotating lower body 105b when the turning effort of the reverse sense is applied to up body 105a of this return device 105 and lower body 105b is applied, the elastic force of spring 105c will be resisted, up body 105a will carry out a RLC, and lower body 105b will carry out a RRC. However, disconnection of the above-mentioned turning effort returns up body 105a and lower body 105b to the original location according to the stability of spring 105c in an instant.

[0029] The male screw of the upper part of up body 105a is thrust into the female screw of the lower part of fixing metal 101, and the return device 105 is fixed to the lower part of fixing metal 101. Furthermore, the male screw formed in the upper part of a shaft 102 is thrust into the female screw of the lower part of lower body 105b, and a shaft 102 is fixed to the lower part of the return device 105.

[0030] Thus, when the return device 105 was established between fixing metal 101 and a shaft 102, the force horizontal to the image pick-up section one A1 of surveillance camera 1A is applied for example, and the sense of an image pick-up of the image pick-up section one A1 is changed, the elasticity of the spring of spring 105c of the return device 105 can be resisted, and the sense of the image pick-up section one A1 can be changed. However, if its hold of the image pick-up section one A1 is released, the sense of the image pick-up section one A1 will return quickly according to the stability of spring 105c. At this time, gyroscope sensor 13b for horizontal angular-velocity detection detects a big angular velocity to drawing 2 .

[0031] For example, when a malfeasance person means a malfeasance, rotates slowly the tip of the image pick-up section one A1 and the visual field of surveillance camera 1A is removed from a monitor field, such a slow change of the sense may be unable to be detected in gyroscope sensor 13 for horizontal angular-velocity detection b. If it does so, change of the image pick-up field by gyroscope sensor 13b for horizontal angular-velocity detection described in the gestalt of the 1st operation is undetectable. However, if a malfeasance person releases his hold of the image pick-up section one A1, since the image pick-up section one A1 returns to the original sense according to the stability of spring 105c of the return device 105 in an instant, gyroscope sensor 13b for horizontal angular-velocity detection will detect a big angular velocity. A big angular velocity detected by such gyroscope sensor 13b for horizontal angular-velocity detection is sent out to the signal sending-out section 12 of surveillance camera 1A, a controller 2 is notified, and it can detect that the malfeasance to surveillance camera 1A occurred.

[0032] As mentioned above, even when change of the horizontal sense to the image pick-up section one A1 is made slow by establishing the return device 105, it can detect that the action to which the image pick-up sense of the image pick-up section one A1 is changed occurred at the time of the return of the subsequent image pick-up section one A1.

[0033] The above example establishes the return device 105 between fixing metal 101 and a shaft 102, and although it described the case where return actuation of the image pick-up section one A1 by gyroscope sensor 13b for horizontal angular-velocity detection was detected, it can establish a new return device so that the return of a vertical sense change may be detected by gyroscope sensor 13a for perpendicular direction angular-velocity detection. For example, the return device (the 2nd return device) same to the justification holder 103 as the above-mentioned return device 105 (the 1st return device) is attached in the both sides of the direction which intersects perpendicularly to head lining pivotable. In that case, the return of the image pick-up section one A1 by stability with the spring of the 2nd return device can detect by gyroscope sensor 13a for perpendicular direction angular-velocity detection.

[0034] Thus, such a malfeasance is detectable by gyroscope sensor 13 for perpendicular direction angular-velocity detection a, and/or gyroscope sensor 13b for horizontal angular-velocity detection by establishing two return devices so that a perpendicular direction and/or horizontal return actuation may be detected.

[0035] It is not limited to the gestalt of operation mentioned above on the occasion of operation of the surveillance camera equipment of this invention, but various deformation modes can be taken.

[0036]

[Effect of the Invention] According to this invention, it is effectively detectable that the image pick-up direction or fields of view of an image pick-up means, such as a surveillance camera, changed.

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TECHNICAL FIELD

[Field of the Invention] This invention installs a surveillance camera in a building, a store, and other locations, and relates to the surveillance camera equipment which supervises and records action of a suspicious person on videotape. This invention relates to a malfeasance which the image pick-up sense of a surveillance camera is changed [malfeasance] unjustly, and does not make a suspicious person picturize especially to beforehand detectable surveillance camera equipment.

[0002] The image data which installed the surveillance camera in the entrance of the inside of the store which is a monitoring station, or a store from the former, and was transmitted from this surveillance camera is displayed on the monitor in which it was prepared in the monitor center, or the surveillance camera equipment which records this image data on videotape and is made into an ex post proof is known. In such surveillance camera equipment, the image pick-up direction is adjusted so that a predetermined monitoring station may be picturized, for example, it attaches in head lining etc., and the surveillance camera is fixed using a device.

[0003] However, with the conventional surveillance camera equipment mentioned above, there is a possibility of performing a malfeasance where those who perform a malfeasance rotated the surveillance camera by hand etc. for example, it changed the image pick-up direction of a surveillance camera and a monitor field is removed from the visual field of a surveillance camera. since an image pick-up condition changes with the malfeasances which change the image pick-up direction of a surveillance camera, if the hitcher on who is present in a monitor center is monitoring the monitor continuously, such a malfeasance can be noticed, but since the hitcher on is not necessarily monitoring the monitor continuously, the case where a malfeasance which changes the image pick-up direction of a surveillance camera is not noticed comes out, and he comes out and comes. Although it can know having changed the image pick-up direction of a surveillance camera from an image transcription result later, it comes after the **** part after the malfeasance was performed then in many cases.

[0004] When switching the image data of many surveillance cameras one by one even when the hitcher on is always supervising the monitor in a monitor pin center, large, and displaying on the monitor, change of such an unjust image pick-up direction may be unable to be supervised.

[0005] As an approach of detecting modification of such inaccurate image pick-up range, he is this applicant, The light emitting/receiving unit was formed in the part which has the surveillance camera currently supported by head lining through fixing metal as indicated to JP, 10-185940, A, reflective units, such as a mirror, were prepared in the location of this light emitting/receiving unit and head lining which counters, when the sense of a surveillance camera is changed, it detected that the reflected light from the light emitting/receiving unit formed in the surveillance camera lost, and the surveillance camera equipment into which the sense of a surveillance camera was changed and which carries out thing detection has been proposed.

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EFFECT OF THE INVENTION

[Effect of the Invention] According to this invention, it is effectively detectable that the image pick-up direction or fields of view of an image pick-up means, such as a surveillance camera, changed.

[Translation done.]

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] Since it is the need that a light emitting/receiving unit is located in a field parallel to the field of head lining, it is necessary to adjust and the approach indicated by JP,10-185940,A needs to arrange the sense of the reflective unit prepared in head lining, the sense of the light emitting/receiving unit attached in a surveillance camera, or both sense so that the field of a reflective unit and the ray axis of a light emitting/receiving unit may intersect perpendicularly, when the sense of an image pick-up of a surveillance camera has a certain include angle to head lining.

[0007] This invention means the improvement approach of the surveillance camera equipment indicated to JP,10-185940,A, or the alternate method of the surveillance camera equipment indicated to JP,10-185940,A, is devised, and aims at offering detectable surveillance camera equipment for the image pick-up direction or visual fields of an image pick-up means, such as a surveillance camera, having changed still more effectively.

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MEANS

[Means for Solving the Problem] According to this invention, the surveillance camera equipment provide an image pick-up means, an installation means attach said image pick-up means in a fixed part, an image pick-up means image pick-up sense change detection means of said image pick-up means detect migration of the direction of a single dimension as change of angular velocity or angular velocity at least, and an alarm-output means detect that the sense of an image pick-up of said image pick-up means changed based on the detection result of said image pick-up means image pick-up sense change detection means, and output an alarm is offered. It is detectable that an action in which an image pick-up means image pick-up sense change detection means detects change of the sense of an image pick-up of an image pick-up means as change of angular velocity or angular velocity, and removes the image pick-up field of image pick-up means, such as a surveillance camera, from a monitor field was performed.

[0009] Preferably, said image pick-up means image pick-up sense change detection means contains two gyroscope sensors which detect the angular velocity of a mutually different direction, for example, a horizontal angular velocity, and a vertical angular velocity. As a sensor used for detection of change of angular velocity, change of angular velocity can be detected only by attaching in an image pick-up means etc., for example, it is not dependent on physical relationship with fixed parts, such as head lining, at all, and a small gyroscope sensor is suitable. By forming two gyroscope sensors which detect a still more nearly horizontal angular velocity and a vertical angular velocity, a three dimension angular-velocity change is detectable.

[0010] Still more preferably, after the force is applied to said image pick-up means between said installation means, said image pick-up means, or said installation means and said image pick-up means and the image pick-up sense of said image pick-up means changes, when the force currently applied is opened wide, the return means which carries out an auto return toward the image pick-up sense of the basis of said image pick-up means is established. If the sense of image pick-up means, such as a surveillance camera to the outside of the unjust visual field mentioned above, is changed slowly, change by the gyroscope sensor is minute and such an unjust action cannot be detected. However, after a malfeasance, if its hold is released, a return means will act and it will return to the original location automatically and quickly. Since migration of the image pick-up means by this return means can detect by the above-mentioned gyroscope sensor, it is detectable immediately after performing a malfeasance.

[0011]

[Embodiment of the Invention] The gestalt of operation of the surveillance camera equipment of this invention is described with reference to an accompanying drawing.

Gestalt drawing 1 of the 1st operation is the whole surveillance camera equipment block diagram of the gestalt of the 1st operation of this invention. Surveillance camera equipment has the image recording equipment 3 connected with the controller 2 connected with two or more surveillance cameras 1A-1D, the surveillance cameras 1A-1D of these plurality, and coaxial cables 5A-5D, and the controller 2 with the coaxial cable 6, and the alarm 4 connected to a controller 2 and image recording equipment 3. In the gestalt of this operation, although the case where four sets of surveillance cameras 1A-1D were prepared was illustrated, the number of a surveillance camera is 1 or plurality, and arbitration.

[0012] Two or more surveillance cameras 1A-1D are equipped with an image pick-up function and a voice detection function, they detect a sound signal, respectively while they picturize a predetermined monitor field, and they output the image pick-up and a voice detection result to a controller 2 through coaxial cables 5A-5D. A controller 2 carries out signal processing of the image pick-up and voice detection result which have been transmitted from surveillance cameras 1A-1D, and sends out the result to image recording equipment 3. About signal processing in a controller 2, it mentions later with reference to drawing 4. For example, a controller 2 makes sequential selection of the image pick-up result (image data) and voice detection result (voice detection data) which were sent out from surveillance cameras 1A-1D, changes the selected image pick-up from a surveillance camera and the selected voice detection result into a digital signal, and sends them out to image recording equipment 3. A controller 2 carries out compression processing of the image data and voice detection data which were changed into the digital signal if needed, and sends them out to image recording equipment 3. Image recording equipment 3 records the image data and voice detection data which were sent out from the controller 2. Abnormality signal processing is carried out, and an alarm 4 sends out an alarm signal to the defense center established in the remoteness which is not illustrated through the telephone line, when the thing with a malfeasance sent out from the controller 2 is detected. An alarm 4 can also send out an alarm signal to the defense center which is not illustrated, when it is detected from image recording equipment 3 again sending out and that carried out abnormality signal processing and the malfeasance occurred.

[0013] Drawing 2 is drawing illustrating the installation condition of typical surveillance camera 1A of the surveillance cameras 1A-1D. Fixing metal 101 turns [head lining] to a lower part, and is being fixed to it. The shaft 102 is established at the tip of lower of fixing metal 101. The justification holder 103 is connected to the shaft 102. These fixing metal 101, a shaft 102, and the justification holder 103 are named generically and attached, and it is called a device or the installation

means 100.

[0014] Surveillance camera 1A has the image pick-up section one A1, the circuit section one A2, and cable 1 A3. The image pick-up section one A1 points to the image pick-up direction D. The monitor field in which ATM was installed ahead of the image pick-up direction D exists. In the gestalt of this operation, surveillance camera 1A picturizes the field in which ATM was installed as a monitor field. Cable 1 A3 also includes the feeder which supplies electric power to the power supply section of the circuit section one A2 including coaxial cable 5A illustrated to drawing 1. The internal configuration of surveillance camera 1A is described with reference to drawing 3.

[0015] Reference of drawing 2 connects the justification holder 103 to the end side of the upper part of the circuit section one A2 of surveillance camera 1A. The tip of the justification holder 103 is fixed to a shaft 102 so that the monitor field which surveillance camera 1A mentioned above can be picturized, and the optical axis of surveillance camera 1A may become an obtuse angle a little to a perpendicular direction. Whenever [fixed angle / of the justification holder 103 to a shaft 102] specifies the image pick-up direction of the vertical direction of surveillance camera 1A. Angle of rotation of the justification holder 103 is adjusted, and the horizontal sense of surveillance camera 1A can be adjusted. Thus, adjustment of whenever [setting-angle / of the justification holder 103 to a shaft 102] and adjustment of angle of rotation of the justification holder 103 can adjust the visual field of surveillance camera 1A in three dimension.

[0016] If a malfeasance person changes whenever [fixed angle / of the justification holder 103 to a shaft 102] or, on the other hand, changes angle of rotation of the justification holder 103, it will also become separating from the visual field of surveillance camera 1A from the monitor field mentioned above. In order to detect change of the sense of such surveillance camera 1A, in the gestalt of this operation, two gyroscope sensors, i.e., gyroscope sensor 13a for perpendicular direction angular-velocity detection a, and gyroscope sensor 13b for horizontal angular-velocity detection were prepared in the interior of the image pick-up section one A1.

[0017] A gyroscope sensor is an angular-velocity sensor which detects vibration of piezo-electric mold vibrator, such as for example, ceramic bimorph vibrator, as Coriolis force, and changes and outputs the detecting signal to an electrical signal. With 8mm long, 15mm wide, and an about [height 4mm] dimension, since the gyroscope sensor is small, it can be easily attached in the image pick-up section one A1 of surveillance camera 1A. Moreover, you do not need to make it located relatively and a gyroscope sensor has an advantage like the light emitting/receiving unit in the surveillance camera equipment indicated to JP,10-185940,A, and a reflective unit that what is necessary is just to attach in surveillance camera 1A. Since one gyroscope sensor detects the angular velocity of one direction fundamentally, when detecting angular velocity with a 2-way, for example, a horizontal direction, and a perpendicular direction to coincidence, two gyroscope sensors are needed. Although it is also good to prepare either gyroscope sensor 13a for perpendicular direction angular-velocity detection a, or gyroscope sensor 13b for horizontal angular-velocity detection in order to detect the angular velocity of the minimum and an one direction for example, in the gestalt of this operation, the example which formed two gyroscope sensors 13a and 13b as suitable conditions is described. It is desirable to form a gyroscope sensor in the point of the image pick-up section one A1 which is the location most distant from the above-mentioned supporting point that is the part which the greatest angular moment generates to the node of the justification holder 103, and the shaft 102 and the justification holder 103 which are immobilization and the pivotable supporting point of surveillance camera 1A so that a bigger angular velocity can be detected. In the gestalt of this operation, gyroscope sensor 13a for perpendicular direction angular-velocity detection and gyroscope sensor 13b for horizontal angular-velocity detection are prepared near the point of the image pick-up section one A1. The gyroscope sensors 13a and 13b are formed in the interior of surveillance camera 1A, and it is preventing from checking by looking from the outside in the gestalt of this operation from a viewpoint which eliminates the malfeasance to the gyroscope sensors 13a and 13b.

[0018] Drawing 3 is one block diagram of surveillance cameras 1A-1D. Surveillance cameras 1A-1D are carrying out the same configuration. As a representative, when surveillance camera 1A is described, surveillance camera 1A has the image pick-up section 10, the sound-collecting section 11, the signal sending-out section 12, and the detection section 13. The image pick-up section 10 is located in the image pick-up section one A1 illustrated to drawing 2, and consists of a lens, a charge KAPPURUDO device (CCD), etc., and the image which let the lens pass changes it into an electrical signal in CCD, and it is outputted as image pick-up data (image data). The sound-collecting section 11 is formed in the image pick-up section one A1 illustrated to drawing 2, has a microphone, collects the sound in a monitor field, changes it into an electrical signal, and outputs it as a voice detecting signal. The sound-collecting section 11 can be formed in the location of the arbitration instead of the image pick-up section one A1. The signal sending-out section 12 is formed in the circuit section one A2 illustrated to drawing 2, inputs the voice detection data outputted from the image data and the sound-collecting section 11 which were outputted from the image pick-up section 10, changes these signals into a predetermined output signal, and sends them out to a controller 2 through coaxial cable 5A. The detection section 13 names generically and illustrates gyroscope sensor 13a for perpendicular direction angular-velocity detection a attached in the image pick-up section one A1 illustrated to drawing 2, and processing circuit 13c which processes the angular-velocity signal with which these gyroscope sensor outputs gyroscope sensor 13b for horizontal angular-velocity detection. In this invention, the angular velocity itself or the signal which shows change of angular velocity can be used as a signal which detects change of the sense.

[0019] Drawing 4 is the block diagram of a controller 2. For example, a controller 2 and surveillance camera 1A are connected by coaxial cable 5A held in the interior of cable 1 A3 illustrated to drawing 2, and the controller 2 is installed in the location from which the installation location of surveillance camera 1A was separated. The connection relation between a controller 2 and the other surveillance cameras 1B-1D is the same as that of the above. A controller 2 has the image-processing section 20, the image output section 21, a control unit 22, a control section 23, the interface section 24, a power supply section 26, the power off detecting element 27, and the alarm-output section 28. The authentication section 25 is formed near the controller 2 of the exterior of a controller 2. The image-processing section 20 quadrisections the image data in four surveillance cameras 1A-1D inputted via coaxial cables 5A-5D, and compresses it into the image

data of one screen. Moreover, the image-processing section 20 chooses the sound signal of 1 from four sorts of sound signals with the control signal of a control section 23, and inputs it into the image output section. The image output section 21 outputs 4 image data compounded in the image-processing section 20, and the selected sound signal to timelapse video equipment 3 through a coaxial cable 6. A control unit 22 is a part into which it has a switch for a setup and operator guidance etc., and an operator performs various setup and operator guidance to a controller 2 through these switches. A control section 23 performs control processing of processing of the image-processing section 20, control processing of the alarm-output section 28, and control processing of the authentication section 25 connected through the interface section 24 based on the conditions which consisted of operation control units (CPU) of a computer etc., and were set up by the control unit 22, and the already specified conditions. The interface section 24 consists of RS232C and performs signal transfer between the authentication section 25 and a control section 23 (signal junction). A control section 23 cooperates with the authentication section 25 through the interface section 24, and performs authentication processing about rating of the operator who operates a controller 2 through a control unit 22 etc. Only the attested operator can perform setting-operation using a control unit 22. The authentication section 25 is a card reader. The interface section 24 has circuitry which suits it depending on the authentication section 25. A power supply section 26 generates the electrical potential difference which operates the electrical circuit in each electrical circuit in a controller 2, and/or the electronic circuitry in each electronic circuitry, and supplies a power source to each circuit inside a controller 2. What the power off detecting element 27 supervised the supply voltage of a power supply section 26, and the electrical potential difference of a power supply section 26 lost it for is detected. For example, when the electrical potential difference of a power supply section 26 loses as a power off detecting element 27 using the relay which operates on the electrical potential difference of a power supply section 26, the alarm 4 connected with the power off detecting element 27 because a relay contact closes can detect the power off of a power supply section 26. The alarm-output section 28 outputs an alarm signal to the alarm 4 illustrated to drawing 1, when a malfeasance person does the cable one A1 illustrated to drawing 2 for cutting etc. and the image data from either of the surveillance cameras 1A-1D stops in the image-processing section 20.

[0020] Drawing 5 is the block diagram of image recording equipment 3. Image recording equipment 3 has the image transcription section 31, a control unit 32, a control section 33, the interface section 34, a power supply section 36, the power off detection section 37, and the alarm-output section 38. The authentication section 35 is formed in the exterior of image recording equipment 3. The image transcription section 31 records on videotape the image data of one screen compressed into the quadrisection which received from the controller 2 on a video tape. A control unit 32 operates initiation of an image transcription, a halt, timer actuation, attachment and detachment of a video tape, etc. The control section 33 consists of operation control units (CPU) of a computer etc., and performs motion control, such as the image transcription section 31 and the alarm-output section 38. The interface section 34 consists of RS232C and performs signal transfer between the authentication section 35 and a control section 33 (signal junction). A control section 33 cooperates with the authentication section 35 through the interface section 34, and performs authentication processing about rating of the operator who operates image recording equipment 3 through a control unit 32 etc. Only the attested operator can perform various kinds of setting-operation to image recording equipment 3 using a control unit 32. The authentication section 35 is a card reader. The interface section 34 has circuitry which suits it depending on the authentication section 35 and a control section 33. A power supply section 36 generates the electrical potential difference which operates the electrical circuit in each electrical circuit in image recording equipment 3, and/or the electronic circuitry in each electronic circuitry, and supplies a power source to each circuit inside image recording equipment 3. What the power off detection section 37 supervised the supply voltage of a power supply section 36, and the electrical potential difference of a power supply section 36 lost it for is detected. For example, when it loses in the electrical potential difference of a power supply section 36 as the power off detection section 37 using the relay which operates on the electrical potential difference of a power supply section 36, the alarm 4 connected with the power off detecting element 27 because a relay contact closes can detect the power off of a power supply section 36. The alarm-output section 38 outputs an alarm signal to the alarm 4 illustrated to drawing 1, when the image data sent out from the controller 2 to the image transcription section 31 stops.

[0021] Actuation of the surveillance camera equipment of the gestalt of this operation is described. Especially processing when the sense of an image pick-up of one image pick-up of the surveillance cameras 1A-1D in the surveillance camera equipment of the gestalt of this operation changes is described. As initial actuation, the power source of each part of surveillance cameras 1A-1D is turned ON. Thereby, surveillance cameras 1A-1D picturize an image pick-up field in each image pick-up section 10, and the image pick-up result is changed into the picture signal of NTSC system in the signal sending-out section 12, and they are sent out to a controller 2 via coaxial cables 5A-5D. The image-processing section 20 in a controller 2 makes four image data picturized with surveillance cameras 1A-1D the image data of one screen. The image output section 21 outputs the image data to image recording equipment 3.

[0022] the surveillance camera into which the image pick-up sense was changed when the sense of one image pick-up of the surveillance cameras 1A-1D was changed here -- for example When the image pick-up sense of surveillance camera 1A is changed, are installed in surveillance camera 1A. Gyroscope sensor 13a for perpendicular direction angular-velocity detection and/or gyroscope sensor 13b for horizontal angular-velocity detection which were illustrated to drawing 2 output the signal according to the angular velocity of the rotation. Processing circuit 13c outputs a signal to the signal sending-out section 12 noting that sense actuation of inaccurate surveillance camera 1A is performed, when the angular-velocity signal shows change of the angular velocity more than predetermined level.

[0023] The signal sending-out section 12 changes the detection result from processing circuit 13c into a predetermined signal, and outputs it to a controller 2 through coaxial cable 5A with image data.

[0024] In the image-processing section 20 of a controller 2, the image data inputted via coaxial cable 5A and the signal which the above-mentioned gyroscope sensor detected are received, and the image-processing section 20 sends out the

signal to a control section 23. A control section 23 is sent out to the alarm-output section 28 by making the result into an abnormality signal, when the above-mentioned signal is received. The alarm-output section 28 outputs an abnormal condition to an alarm 4 as an alarm signal. When the alarm signal is received, the alarm output of the alarm 4 is carried out to the defense pin center, large which is not illustrated through the telephone line. Consequently, it is notified that the image pick-up sense of surveillance camera 1A was unjustly changed into the guard in a defense pin center, large, and a quickly exact cure can be taken.

[0025] As mentioned above, although the example which prepared gyroscope sensor 13a for perpendicular direction angular-velocity detection and gyroscope sensor 13b for horizontal angular-velocity detection was described as a gestalt of suitable operation, change of the sense of the direction of a single dimension of surveillance camera 1A is detectable at least also only by preparing either gyroscope sensor 13 for perpendicular direction angular-velocity detection a, or gyroscope sensor 13b for horizontal angular-velocity detection. Moreover, the signal sending-out section 12 may stop sending out of this pilot signal, when the pilot signal of predetermined frequency is always sent out to the controller 2 and a gyroscope sensor detects abnormalities. In this case, by the controller 2, if reception of a pilot signal becomes impossible, it will judge that a surveillance camera is unusual and an abnormality signal will be transmitted to an alarm 4.

[0026] With reference to gestalt drawing 6 of the 2nd operation, the surveillance camera equipment as a gestalt of the 2nd operation of this invention is described. Drawing 6 is drawing showing the installation condition of the surveillance camera as a gestalt of the 2nd operation of this invention corresponding to drawing 2. Although the installation condition of the surveillance camera illustrated to drawing 6 is similar to the installation condition of the surveillance camera illustrated to drawing 2, in drawing 6, the return device 105 is established between fixing metal 101 and a shaft 102. That is, it attaches and means 100A is having structure which was illustrated to drawing 6, which was illustrated to drawing 2 and to which it attached in and the return device 105 was added to the means 100. Other components are the same as that of what was described with reference to drawing 2.

[0027] Drawing 7 is drawing illustrating the structure of the return device 105 illustrated to drawing 6. Drawing 7 (A) is the perspective view of the return device 105, drawing 7 (B) is the expansion side elevation of the return device 105, and drawing 7 (C) is the decomposition sectional view of the return device 105. Up body 105a, lower body 105b, and spring 105c are put together, and the return device 105 is constituted. The male screw projects in the upper and lower sides of up body 105a. The male screw of the upper part of up body 105a is thrust into the female screw of the lower part of fixing metal 101, and makes the lower part fix the return device 105 to fixing metal 101. The hole is prepared, the female screw with which the male screw of the lower part of up body 105a is screwed in is formed in the hole of the upper part of lower body 105b, and, as for the center of lower body 105b, the female screw with which the male screw (not shown) of a shaft 102 is screwed in is formed in the hole of the lower part of lower body 105b.

[0028] Where it fixed the end of spring 105c to the spring fixed hole of up body 105a and the outer case section of up body 105a and lower body 105b is held in the interior of spring 105c. If the male screw of the lower part of up body 105a is thrust into the female screw of the upper part of lower body 105b and the other end of spring 105c is finally fixed to the screw fixation section of lower body 105b, the return device 105 illustrated to drawing 7 (A) will be composed. If the force of making left-hand side L rotating up body 105a, and for example making right-hand side R rotating lower body 105b when the turning effort of the reverse sense is applied to up body 105a of this return device 105 and lower body 105b is applied, the elastic force of spring 105c will be resisted, up body 105a will carry out a RLC, and lower body 105b will carry out a RRC. However, disconnection of the above-mentioned turning effort returns up body 105a and lower body 105b to the original location according to the stability of spring 105c in an instant.

[0029] The male screw of the upper part of up body 105a is thrust into the female screw of the lower part of fixing metal 101, and the return device 105 is fixed to the lower part of fixing metal 101. Furthermore, the male screw formed in the upper part of a shaft 102 is thrust into the female screw of the lower part of lower body 105b, and a shaft 102 is fixed to the lower part of the return device 105.

[0030] Thus, when the return device 105 was established between fixing metal 101 and a shaft 102, the force horizontal to the image pick-up section one A1 of surveillance camera 1A is applied for example, and the sense of an image pick-up of the image pick-up section one A1 is changed, the elasticity of the spring of spring 105c of the return device 105 can be resisted, and the sense of the image pick-up section one A1 can be changed. However, if its hold of the image pick-up section one A1 is released, the sense of the image pick-up section one A1 will return quickly according to the stability of spring 105c. At this time, gyroscope sensor 13b for horizontal angular-velocity detection detects a big angular velocity to drawing 2.

[0031] For example, when a malfeasance person means a malfeasance, rotates slowly the tip of the image pick-up section one A1 and the visual field of surveillance camera 1A is removed from a monitor field, such a slow change of the sense may be unable to be detected in gyroscope sensor 13 for horizontal angular-velocity detection b. If it does so, change of the image pick-up field by gyroscope sensor 13b for horizontal angular-velocity detection described in the gestalt of the 1st operation is undetectable. However, if a malfeasance person releases his hold of the image pick-up section one A1, since the image pick-up section one A1 returns to the original sense according to the stability of spring 105c of the return device 105 in an instant, gyroscope sensor 13b for horizontal angular-velocity detection will detect a big angular velocity. A big angular velocity detected by such gyroscope sensor 13b for horizontal angular-velocity detection is sent out to the signal sending-out section 12 of surveillance camera 1A, a controller 2 is notified, and it can detect that the malfeasance to surveillance camera 1A occurred.

[0032] As mentioned above, even when change of the horizontal sense to the image pick-up section one A1 is made slow by establishing the return device 105, it can detect that the action to which the image pick-up sense of the image pick-up section one A1 is changed occurred at the time of the return of the subsequent image pick-up section one A1.

[0033] The above example establishes the return device 105 between fixing metal 101 and a shaft 102, and although it described the case where return actuation of the image pick-up section one A1 by gyroscope sensor 13b for horizontal

angular-velocity detection was detected, it can establish a new return device so that the return of a vertical sense change may be detected by gyroscope sensor 13a for perpendicular direction angular-velocity detection. For example, the return device (the 2nd return device) same to the justification holder 103 as the above-mentioned return device 105 (the 1st return device) is attached in the both sides of the direction which intersects perpendicularly to head lining pivotable. In that case, the return of the image pick-up section one A1 by stability with the spring of the 2nd return device can detect by gyroscope sensor 13a for perpendicular direction angular-velocity detection.

[0034] Thus, such a malfeasance is detectable by gyroscope sensor 13 for perpendicular direction angular-velocity detection a, and/or gyroscope sensor 13b for horizontal angular-velocity detection by establishing two return devices so that a perpendicular direction and/or horizontal return actuation may be detected.

[0035] It is not limited to the gestalt of operation mentioned above on the occasion of operation of the surveillance camera equipment of this invention, but various deformation modes can be taken.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] Drawing 1 is the block diagram of the surveillance camera equipment of the gestalt of the 1st operation of this invention.

[Drawing 2] Drawing 2 is drawing illustrating the installation condition of the surveillance camera as a gestalt of the 1st operation of this invention.

[Drawing 3] Drawing 3 is the block diagram of a surveillance camera.

[Drawing 4] Drawing 4 is the block diagram of the controller in surveillance camera equipment.

[Drawing 5] Drawing 5 is the block diagram of the image recording equipment in surveillance camera equipment.

[Drawing 6] Drawing 6 is drawing illustrating the installation condition of the surveillance camera as a gestalt of the 2nd operation of this invention.

[Drawing 7] Drawing 7 (A) is the perspective view of a return device, drawing 7 is drawing illustrating the return device illustrated to drawing 6, and drawing 7 (C) is [drawing 7 (B) is the expansion side elevation of a return device and] the decomposition sectional view of a return device.

[Description of Notations]

1A-1D .. Surveillance camera

One A1 .. Image pick-up section

One A2 .. Circuit section

1 A3 .. Cable

10 .. Image pick-up section

11 .. Sound-collecting section

12 .. Signal sending-out section

13 .. Detection section

13a .. Gyroscope sensor for perpendicular direction angular-velocity detection

13b .. Gyroscope sensor for horizontal angular-velocity detection

2 .. Controller

20 .. Image-processing section

21 .. Image output section

22 .. Control unit

23 .. Control section

24 .. Interface section

25 .. Authentication section

26 .. Power supply section

27 .. Power off detecting element

28 .. Alarm-output section

3 .. Image recording equipment

31 .. Image transcription section

32 .. Control unit

33 .. Control section

34 .. Interface section

35 .. Authentication section

36 .. Power supply section

37 .. Power off detection section

38 .. Alarm-output section

4 .. Alarm

100 .. Installation means

101 .. Fixing metal

102 .. Shaft

103 .. Justification holder

105 .. Return device

105a .. Up body

105b .. Lower body

105c .. Spring

[Translation done.]

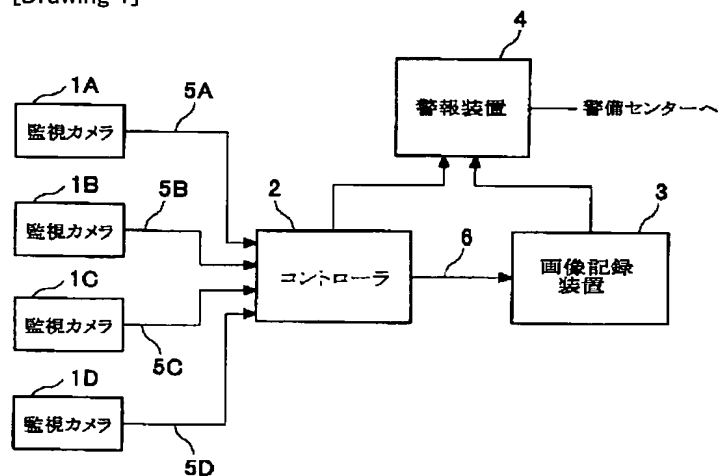
* NOTICES *

JPO and NCIP are not responsible for any damages caused by the use of this translation.

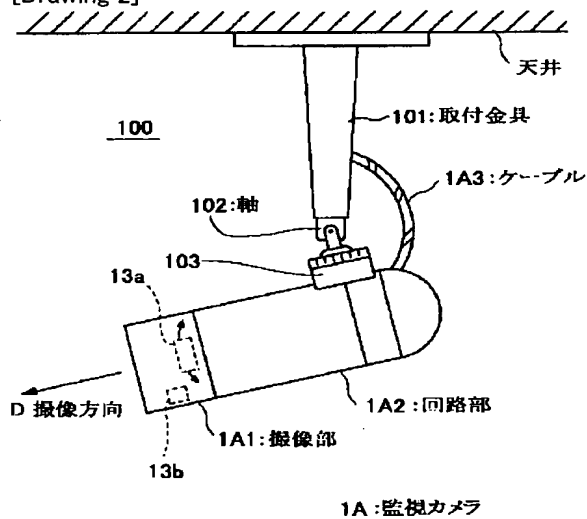
- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.*** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

DRAWINGS

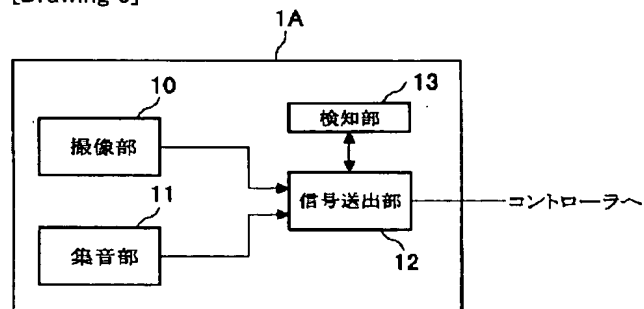
[Drawing 1]



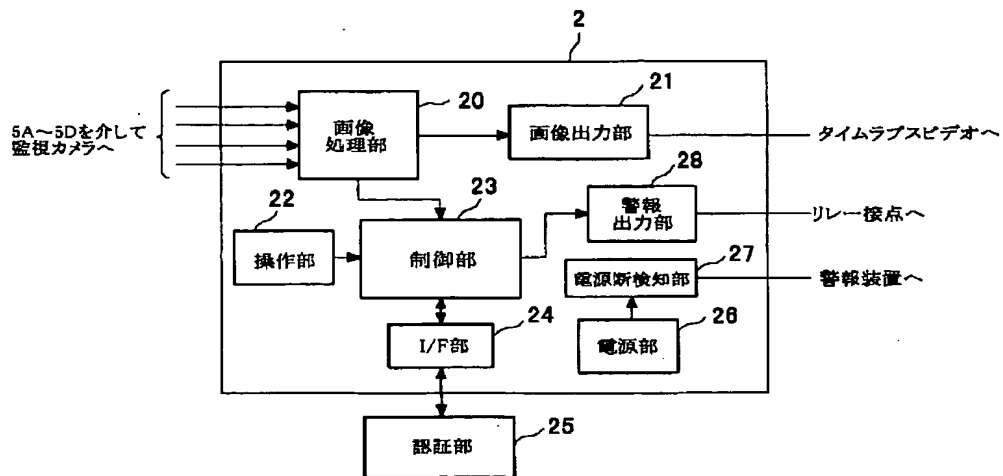
[Drawing 2]



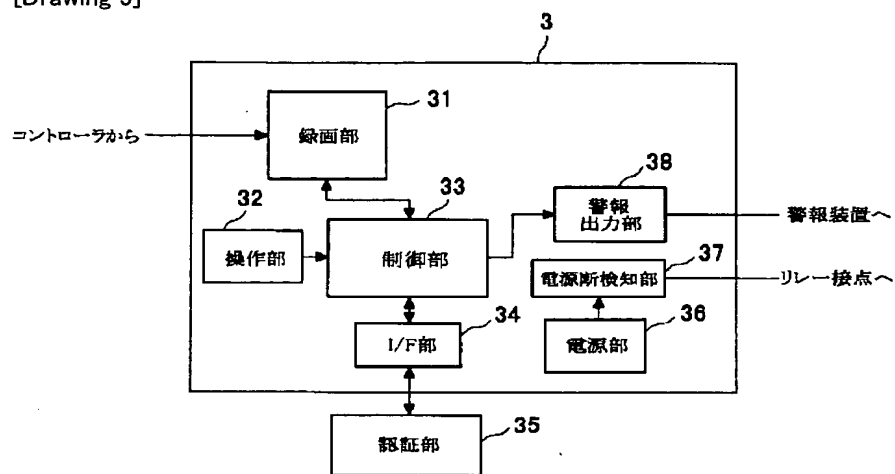
[Drawing 3]



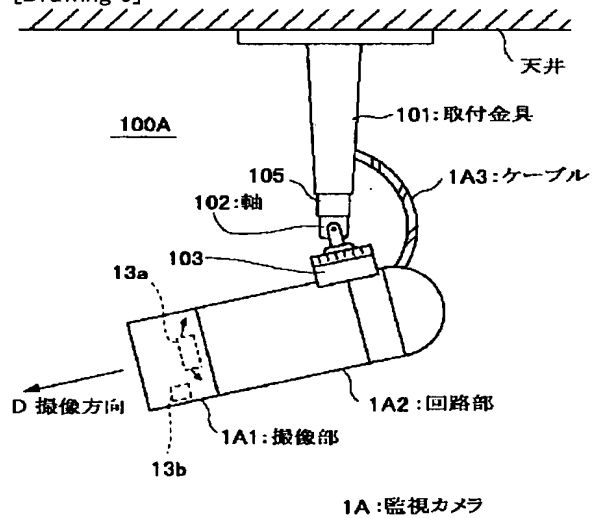
[Drawing 4]



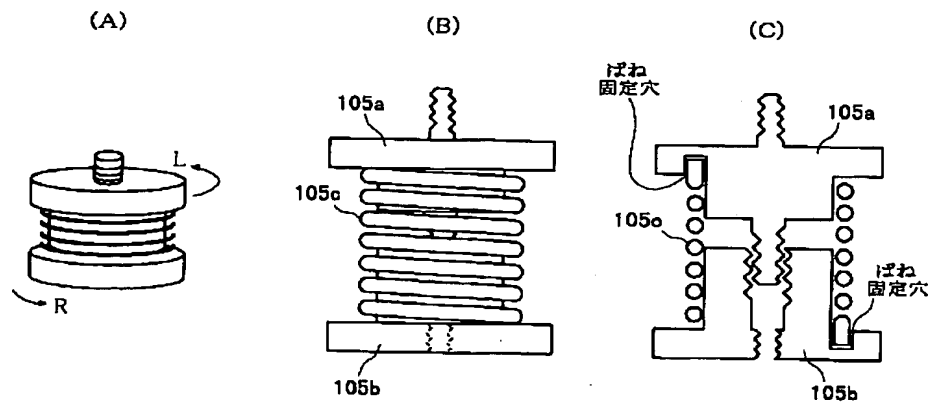
[Drawing 5]



[Drawing 6]



[Drawing 7]



[Translation done.]